

Association of Urinary Incontinence and Body Mass Index with Polycystic Ovary Syndrome

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ABSTRACT

Background: Polycystic ovary syndrome (PCOS) is a metabolic disorder, which impacts and effects body's multiple system. Female with more fat deposition in her body and higher body mass index (BMI) will eventually face metabolic disorders like polycystic ovary syndrome, diabetes and urinary incontinence (UI). Muscles in the pelvic floor are susceptible and sensitive to androgen and are easily stimulated by presence or increased levels of androgen and due to hyperandrogenemia muscle mass increases and eventually pressure on Levator Ani and urethral sphincter increases and it causes muscle weakness in the pelvic floor and urinary incontinence and patients often complains with urine leakage.

Objective: To describe the association between urinary incontinence and the body mass index with polycystic ovarysyndrome.

Methodology: The study was analytical cross-sectional study. This study included the sample of 113 nulliparous females having age between 18-45 years. Quota sampling technique was used in this study. Participants were divided into two groups, in one group females with diagnosed PCOS were taken and in other quota we had females without PCOS condition. We provided them the International Incontinence Consultation Questionnaire-Short Form (ICIQ-SF), which is a specific questionnaire that assesses the problem of UI symptoms.

Results: ICIQ-SF statistics were checked applying chi-square testing. Results showed value less than Alpha value which was 5% (0.05) so, the results were statistically significant and alternate hypothesis was accepted which showed UI and BMI had a significant relation with PCOS. This study will be beneficial in creating awareness among society that endocrine system and body mass index play important role in causing Urinary Incontinence and other health issues.

Conclusion: According to this study's findings, there is a strong correlation between UI and BMI with PCOS.

Keywords: Urinary incontinence (UI), Body mass index (BMI), Polycystic ovary syndrome (PCOS), International Consultation on Incontinence Questionnaire-Urinary Incontinence (ICIQ-UI), Pelvic Floor Dysfunction (PFD).

INTRODUCTION

Like all other Female Health Issues PCOS should be considered as one of the most important health issues of now a days because it is affecting a large number of females of reproductive age. (1) In the physical examination, the following criteria should be determined. Obesity, hyperandrogenic symptoms, nigricans acanthosis and pathologic changes in ovaries. Bilateral ovarian changes on pelvic examination are observed in PCOS. (1) During an anovulatory infertility test, PCOS may be detected as early as puberty age comes. It is often overlooked due to the variability of expression levels. (2)

Literature suggests presence of androgen receptors in levator ani muscle and pelvic fascia. (2) The musculature of the pelvic floor and the fascia have found androgen receptors and the administration of testosterone has been shown to enhance levator ani hypertrophy and increase stress incontinence in a rodent model. Increase in androgen levels causes levator Ani muscle stimulation as a result over activity of this muscle tends to show urinary incontinence. In women, low testosterone serum is linked with escalated anxiety risk as well as mixed urinary incontinence. (3) The developing aggregation of terminal hairs that extend across chin, throat and sideburns confirms the existence of excess androgen. (4)

Studies have shown that obesity is a factor that predisposes PCOS. (4) Chronic anovulation along with hyperandrogenemia leads to raise in atretic follicles that becomes a cystic form and fall in number of interstitial tissue in the ovarian matrix start giving us a typical image of ovaries in PCOS. (1) Disturbance in homeostasis and body system functioning leads to imbalance in hormones and it causes increase in testosterone and androgen levels. (5) The use of androgens and anabolic steroids is widely known to increase muscle mass and strength. It is possible that females with PCOS may have an enhanced muscle mass compared to controls due to the features of obesity and hyperandrogenism in PCOS. (6)

Apparently, it looks great to have muscle mass getting increase incredibly but this isn't increasing in a natural way and it is

causing several other complications i.e urinary incontinence that needs to be get settle down as early as possible so that further health issues can be avoided. (4) So, to deal with this issue many of the female consult their endocrinologist and started taking medications to overcome obesity. Weight gain and obesity plays a vital role increase in pressure on intra-abdominal region and eventually it becomes the vital cause of urinary incontinence. (5) Obesity data appears to support metabolic syndrome as a cause and predictor of symptoms of lower urinary track in women. Many of the people with lower signs of urinary track will be overweight and have metabolic syndrome characteristics. (7)

It is necessary to reduce weight to decrease intra-abdominal pressure and to make pelvic organs and pelvic muscles to work properly. Obesity sensitizes thecal cells to LH stimulation and by upregulating the development of ovarian androgen amplifies active ovarian hyper androgen. Interventions in the lifestyle concentrating on diet-weight loss and regular exercise are central to treatment. (8)

More information is required on the topic that discuss the association of these three conditions UI and BMI with PCOS altogether. Literature is not available considering our targeted population. It is important to find out the association to spread awareness amongst our population and other health care professionals in our sector, about the importance of physiotherapy treatment in UI symptoms and obesity in patients with PCOS.

MATERIALS AND METHODS

Analytical cross-sectional research design was used in this study. The data was gathered from Punjab University., LCWU, Kinnaird College, FMH Hospital, Jinnah hospital, Services Hospital and Medical Camp at Suhail Hospital Raiwind, Farooq Hospital, Naseer Hospital, Al-Noor Diagnostic Center, Sheikh Zayed Hospital and gym and fitness centers of surrounding areas from 01-01-2020 to 08-01-2020. The sampling technique of this study was Quota Sampling. Women were divided into two strata units, one group includes females with diagnosed PCOS were taken and in other

quota we had females without PCOS condition.

The calculated sample size was n=113. With 80 percent confidence interval, the formula yields the expected population percentage P=0.22 and absolute precision d=0.05:

$$n = \frac{z^2 \cdot p \cdot (1-p)}{d^2}$$

The estimated population percentage was P=0.22. Evidence are present which shows definite association between urinary continence and body mass index with PCOS.(9)

Nulliparous females with age limit of 18-45 years of age were included in this study. Pregnant females, females with pelvic surgeries, females with pituitary adenoma, adrenal hyperplasia, acromegaly and Cushing's syndrome were excluded from the study.

The data was collected from Punjab University, LCWU, Kinnaird College, Jinnah hospital, FMH Hospital, Services Hospital and Medical Camp at Suhail Hospital Raiwind. In this review, All ethical issues were taken into account, and participants' informed consent was secured. Every subject's demographic information was logged. The study was analytical cross-sectional study it included sample of 113 females comprising of two groups having. Quota Sampling technique was used in this study. Two quotas were formed in one group females with diagnosed PCOS were taken and in other quota we had females with no PCOS condition. Questionnaire were provided to them and data was collected. ICIQ-SF questionnaire measures incontinence of urine was used.

Data analysis was performed on SPSS software version 23.0. Continuous variable like age was computed using the mean and standard deviation. While categorical variables like marital status, ICIQ-UI sum score.

BMI, PCOS status were explained using percentage and frequency. Continuous variables like age were presented using pie charts or bar graphs. For concluding results for association of urinary incontinence and body mass index with PCOS 'Chi-Square, Test of Independence' was used.

RESULTS

The study was conducted to describe the association between urinary incontinence and the body mass index with polycystic ovary syndrome.

Total 113 women participated in this research. Ages ranged from 18 to 45 for all the females, with a mean of 26.27 and a standard deviation of 3.933. In this study 113 females participated out of which 19.47% females were having BMI above overweight range or obese and 38.05% females were having higher BMI ranges and 42.48% females were having normal BMI. Out of 113 females, this study showed 61.06% females were diagnosed cases of PCOS where as 38.94% females were normal.

The questionnaire used for this research study is ICIQ-UI to check urinary incontinence and data was collected from 113 females. This study shows 42.28% females were not having any kind of Urinary Incontinence where as 42.48% and 15.04% females showed mild and moderate urinary incontinence, respectively.

Table 1: Cross table of PCOS yes/no with Sum score of ICIQ-UI Q1+Q2+Q3

	Sum score of ICIQ-UI Q1+Q2+Q3				
	None	Slight (15)	Moderate (612)	Severe (1318)	Total
PCOS yes/no No (Absent)	40	3	1	0	44
Yes (present)	9	34	23	3	69
	49	37	24	3	113

This study concludes that there is significant association of urinary incontinence and BMI with PCOS, out of 113 females 69

females with PCOS condition were having urinary incontinence from slight to moderate and few with severe symptoms along with this many of them were having higher BMI value too. So, the presence of these two conditions together having higher BMI and PCOS aggravates urinary incontinence condition.

Table 2: Chi Square test

	Value	Df	Asymptotic. Significance.(2-sided)
Pearson Chi-Square	66.475	3	.000
Likelihood Ratio	75.199	3	.000
Linear-by-Linear Association	50.890	1	.000
N of Valid Cases	113		

In table given below shows significant value that is less than Alpha value which is 5% (0.05) alternate hypothesis were accepted showing significant association between urinary incontinence and BMI with PCOS.

Table 3: Crosstab of PCOS with BMI of patient

PCOS yes/no	BMI of patient				Total
	No (Absent)	Normal (18.5-24.9)	Overweight (25-29.9)	Obese (30.35)	
Yes (present)					
		38	3	3	44
		10	19	40	69
		48	22	43	113

Table 4: Chi Square test

	Value	df	Asymptotic. Significance.(2-sided)
Pearson Chi-Square	57.069	2	.000
Likelihood Ratio	62.661	2	.000
Linear-by-Linear Association	50.169	1	.000
N of Valid Cases	113		

Table below shows P-value is less than 0.05 so it shows there is association between PCOS condition and BMI.

Table 5: Cross table of BMI of patient with Sum score of ICIQ-UI Q1+Q2+Q3

		Sum score of ICIQ-UI Q1+Q2+Q3				Total
		none	slight (15)	Moderate (612)	Severe (1318)	
BMI of patient	Normal (18.5-24.9)	44	2	2	0	48
	Overweight (25-29.9)	1	13	8	0	22
	Obese (30-35)	4	22	14	3	43
Total		49	37	24	3	113

Table 6: Chi-Square Tests

	Value	df	Asymptotic. Significance.(2-sided)
Pearson Chi-Square	82.50	6	.00
Likelihood Ratio	2	0	
Linear-by-Linear Association	49.27	1	.00
N of Valid Cases	5		

P-value is less than 0.05 so this shows there is association present between BMI and Urinary Incontinence problem.

DISCUSSION

Findings of this study suggests indicates there is a significant association of urinary incontinence and BMI with PCOS. Females with PCOS condition are facing urinary complications too.

Not all of the women included in this study were having urinary incontinence issue but many of them were having. This showed that all affected females of PCOS do not have urinary system issues. The study purpose was to analyze the association of urinary incontinence and BMI with PCOS and results of this study showed that from all PCOS affected females mostly females with urinary symptoms were those who were having higher BMI values. Previous studies showed that fat deposition in body becomes the predisposing factor of PCOS and larger proportion of adipose

tissues in body causes raise in androgen levels and pelvic floor muscle levator ani and urethral sphincter are sensitive to androgen hormones as a result females with higher BMI values will face urinary incontinence problem. (9)

The obtained results from this study were supported by few other researches too, which said hormonal imbalance influences urinary incontinence issue. Androgen levels raises and hence they trigger the activity of bladder and pelvic floor. (10) Another research showed that raise in body mass causes over pressure exertion on bladder and pelvic floor muscles as a result urinary problem symptoms are observed in such cases. (11) Obesity plays a vital role is hormonal imbalance and PCOS it is a predisposing factor for PCOS and their consequences effects major body organs for example Urinary system, body's metabolic system reducing weight will cause improvement in condition. (12)

Previous study showed that high BMI and PCOS both are involved in causing urinary incontinence. (13) But few researches says that there was no marked problem of urinary incontinence in females with PCOS their pelvic floor muscle thickness is not enough to cause them urinary incontinence. If their condition will remain untreated may be then it will be able to cause any kind of urinary problem but in early situation it is not able to do any harm to pelvic floor thickness. (14)

In our study, results were slightly unpredictable then our expectations this may had several reasons but few of them are discussed, the attitude of females towards their health care. Many of the females had this issue but they were more concerned about their issue related to their physical appearance like they were more concerned about their masculine features due to PCOS rather focusing on their other organs being affected by PCOS problem. Secondly females in our society still consider it a taboo they don't want to discuss these issues and think it will get resolved on their own so for further researches on this problem or topic related to this condition this should be kept in mind that first the researchers needs to spread awareness regarding urinary incontinence problem, cure of this problem and benefits of consultation. Secondly this is a serious problem that needs attention a data being collected from 113 females were not sufficient to get proper statistical results which could be applicable for a large population so large sample size is required for having better results which could be beneficial for large population.

CONCLUSION

The results of this study showed a significant association between body mass index and urinary incontinence with polycystic ovary syndrome. Raised BMI and PCOS both causes symptoms of urinary

incontinence but the combination of these two situations together triggers bladder activity and causes urinary incontinence along with other fluctuations in normal body functioning.

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